

**Listing of Claims:**

1. (Original) A homogeneous process for the hydrogenation of dicarboxylic acids and/or anhydrides in the presence of a catalyst comprising:

- (a) ruthenium, rhodium, iron, osmium or palladium; and
- (b) an organic phosphine;

wherein the hydrogenation is carried out in the presence of at least about 1% by weight water and wherein the reaction is carried out at a pressure of from about 500 psig to about 2000 psig and a temperature of from about 200 °C to about 300 °C such that from about 1 mol to about 10 mol of hydrogen are used to strip 1 mole of product from the reactor.

2. (Original) A process according to Claim 1 wherein the process is a continuous process comprising the steps of:

- (a) feeding the dicarboxylic acid and/or anhydride to the hydrogenation reactor;
- (b) hydrogenating the dicarboxylic acid and/or anhydride;
- (c) recovering the product in an hydrogen stream;
- (d) separating the product from the hydrogen stream;
- (e) recycling the hydrogen stream to the reactor;
- (f) separating any removed catalyst and recycling the catalyst to the reactor; and
- (g) recovering the product.

3. (Currently Amended) A process according to Claim 1 ~~[[or 2]]~~ wherein the dicarboxylic acid and/or anhydride is a C<sub>4</sub> dicarboxylic acid or anhydride such that the process is a process for the production of butanediol, tetrahydrofuran and/or  $\gamma$ -butyrolactone.

4. (Original) A process according to Claim 3 wherein any  $\gamma$ -butyrolactone produced in the hydrogenation reaction is recycled to the hydrogenation reactor.

5. (Currently Amended) A process according to Claim 3 ~~[[or 4]]~~ wherein the C<sub>4</sub> dicarboxylic acid or anhydride is fumaric acid, maleic anhydride, maleic acid, succinic acid or succinic anhydride.

6. (Currently Amended) A process according to ~~any one of~~ Claim~~[[s]]~~ 1 ~~[[to 5]]~~ wherein the water is present as the solvent for the reaction.

7. (Currently Amended) A process according to ~~any one of~~ Claim~~[[s]]~~ 1 ~~[[to 5]]~~ wherein one or both of the reactants or the product are the solvent for the catalyst.

8. (Original) A process according to Claim 7 wherein a solvent is used and the water is present as an additive in the solvent.

9. (Currently Amended) A process according to ~~any one of~~ Claim~~[[s]]~~ 1 ~~[[to 5]]~~ wherein the water is produced in situ as a by-product of the hydrogenation reaction.

10. (Currently Amended) A process according to ~~any one of~~ Claim~~[[s]]~~ 1 ~~[[to 9]]~~ wherein the reaction takes place in more than one reactor and the reactors are operated in series.

11. (Currently Amended) A process according to ~~any one of~~

Claim[[s]] 1 [[to 9]] wherein the reaction is carried out at a pressure of about 900 psig.

12. (Currently Amended) A process according to ~~any one of~~ Claim[[s]] 1 [[to 10]] wherein the reaction is carried out at a temperature of about 240 °C to about 250 °C.

13. (Currently Amended) A process according to ~~any one of~~ Claim[[s]] 1 [[to 12]] wherein the catalyst is a ruthenium/phosphine catalyst.

14. (Currently Amended) A process according to ~~any one of~~ Claim[[s]] 1 [[to 13]] wherein, the ruthenium is present in an amount of from 0.0001 to 5 mol as ruthenium per liter of reaction solution.

15. (Currently Amended) A process according to ~~any one of~~ Claim[[s]] 1 [[to 14]] wherein the phosphine is tridentate phosphine.

16. (Currently Amended) A process according to ~~any one of~~ Claim[[s]] 1 [[to 14]] wherein the phosphine is selected from trialkylphosphines, dialkylphosphines, monoalkylphosphines, triarylphosphines, diarylphosphine, monoarylphosphines, diarylmonoalkyl phosphines and dialkylmonoaryl phosphines.

17. (Currently Amended) A process according to Claim 16 wherein the phosphine is selected from tris-1,1,1-(diphenylphosphinomethyl)methane, tris-1,1,1-(diphenylphosphinomethyl)-ethane, tris-1,1,1-(diphenylphosphinomethyl)propane, tris-1,1,1-

(diphenylphosphinomethyl)butane, tris-1,1,1-(diphenylphosphinomethyl)2,2dimethylpropane, tris-1,3,5-(diphenylphosphinomethyl)cyclohexane, tris-1,1,1-(dicyclohexylphosphinomethyl)ethane, tris-1,1,1-(dimethylphosphinomethyl)ethane, tris-1,1,1(diethylphosphinomethyl)ethane, 1,5,9-triethyl-1,5,9-triphosphacyclododecane, 1,5,9-triphenyl-1,5,9-triphosphacyclododecane, bis(2-diphenylphosphinoethyl)phenylphosphine, bis-1,2-(diphenyl phosphino)ethane, bis-1,3-(diphenyl phosphino)propane, bis-1,4-(diphenyl phosphino)butane, bis-1,2-(dimethyl phosphino)ethane, bis-1,3-(diethyl phosphino)propane, bis-1,4-(dicyclohexyl phosphino)butane, tricyclohexylphosphine, trioctyl phosphine, trimethyl phosphine, tripyridyl phosphine, and triphenylphosphine.

18. (Original) A process according to Claim 16 wherein the phosphine is selected from tris-1,1,1-(diarylphosphinomethyl)alkane and tris-1,1,1-(dialkylphosphinomethyl)alkane.

19. (Currently Amended) A process according to ~~any one of~~ Claim[[s]] 1 [[to 18]] wherein, the phosphine is present in ~~in~~ an amount of from 0.0001 to 5 mol as phosphine per liter of reaction solution.

20. (Currently Amended) A process according to ~~any one of~~ Claim[[s]] 1 [[to 19]] wherein the catalyst is regenerated in the presence of water and hydrogen.